Parker Hannifin Corporation

Customer Success Story

Autodesk® DesignStudio®
(Now known as Autodesk Alias Design)
Autodesk® Inventor®
Autodesk® Showcase®
Autodesk® Maya
Autodesk® Streamline
Autodesk® Moldflow
AutoCAD® Electrical

By using Digital Prototyping, we're reducing our reliance on physical prototypes and have a better chance of getting the physical prototype right the first time.

—David Bosworth
Manager Enterprise Engineering Systems
Parker Hannifin

Success in motion.

Parker Hannifin, the global leader in motion and control technologies, standardizes on the Autodesk solution for Digital Prototyping.

Image courtesy of Chelsea Products Division, Parker Hannifin Corp.

Project Summary

With annual sales exceeding $12 billion, Parker Hannifin Corporation (Parker) designs and manufactures products vital to virtually everything that moves or needs to be controlled. The company's motion and control technologies are critical in a wide-variety of commercial, mobile, industrial, and aerospace markets. To increase revenues and margins, Parker recently transitioned from simply supplying parts to offering customers complete motion and control systems. The Autodesk® solution for Digital Prototyping has helped Parker shift its focus by supporting a streamlined, highly efficient product development process.

The company combines surface models from Autodesk® Alias® software, electrical schematics created in AutoCAD® Electrical, and mechanical design data from Autodesk® Inventor® to create a single digital model. Parker shares digital models, which are accurate digital prototypes, with reviewers and customers using the visualization tools in Autodesk® Showcase® and the collaboration tools in Autodesk® Streamline. Thanks to the Autodesk solution for Digital Prototyping, Parker is able to:

- Reduce physical prototyping
- Get to market faster by increasing productivity
- Rely on accurate renderings of digital prototypes for use in marketing materials
- Impress and win customers with its systems designs

Autodesk®

By using Autodesk products, Parker Hannifin finds it easier to innovate faster and win over customers.

The Challenge

For 90 years, Parker has been a leader in the motion and control industry. With more than 250 manufacturing plants and nearly 60,000 employees, streamlined operations are critical to the company's success. Parker's globally dispersed design teams need to work together seamlessly, and the company's internal and outsourced manufacturing teams must clearly understand design intent.

"We have people all over the world, and we need to communicate designs across the enterprise in a consistent manner," says David Bosworth, manager, enterprise engineering systems at Parker Hannifin. "Unless our design teams use the same set of tools, they'll have difficulty sharing data with each other, our manufacturers, and our customers."

Once primarily a supplier of parts, Parker now offers complete motion and control systems, adding engineering value to customers. To execute its plans effectively, the company has adopted a strategic initiative called Winovation that is aimed at creating more profitable growth by developing the right products the right way.

The Solution

In support of the Winovation initiative, Parker has standardized on the Autodesk solution for Digital Prototyping. With the majority of Parker's divisions adopting a common methodology and software platform, the company is able to facilitate collaboration, increase productivity, and impress customers.

Collaborative Design Process

The engineers on Parker's global design teams use Autodesk Inventor, the foundation for Digital Prototyping, to design components for the company's complex systems. In a highly collaborative process, teams contribute their expertise to a single digital prototype that drives every step of the product development process.

Recently, Parker used Autodesk Inventor to design a system featuring the company's hybrid hydraulic technology. It harnesses the kinetic energy of a truck, stores it in an accumulator, and then discharges energy for fast acceleration. Each time the truck brakes, the accumulator stockpiles energy.

Multiple divisions at Parker had to collaborate to develop the complex system. "These teams weren't used to working together, but they did so seamlessly using Inventor," says Bosworth. "For example, a team in Illinois designed the accumulator. A separate connectors division designed the fittings, hoses, and piping for the system. Our hydraulic pump and motor team designed the pump assembly, while others worked on the mechanical assembly."

Parker pulled together design work from the different teams into a single digital prototype. Then engineers tested the model using the finite element analysis (FEA) and simulation features part of Inventor as well as analysis tools from ANSYS and Blue Ridge Numerics, both Autodesk partners. "We were able to make sure that all the components worked together," says Bosworth. "With our disparate teams using Autodesk Inventor, it was a straightforward process."

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Digital Prototyping Drives Efficiencies

Parker gives Digital Prototyping credit for speeding up its product development process and lowering costs. The company creates fewer physical prototypes because it can test prototypes virtually—and vigorously. Now, instead of creating multiple physical prototypes for a design, Parker usually makes only one.

"Even if we can eliminate a single physical prototype, we save time and money," explains Bosworth. "By using Digital Prototyping, we're reducing our reliance on physical prototypes and have a better chance of getting the physical prototype right the first time."

Integrating Design Data

Parker integrates electrical schematics created in AutoCAD Electrical and surface models created in Autodesk Alias software into its digital prototypes.

AutoCAD Electrical automates manual electrical-control design tasks, making it possible for Parker to quickly achieve new heights in electrical design. "We don't just provide hydraulic parts," explains Bosworth. "We use electrical and electronic activation. AutoCAD Electrical is helping us enhance the hydraulic and pneumatic circuits inside our

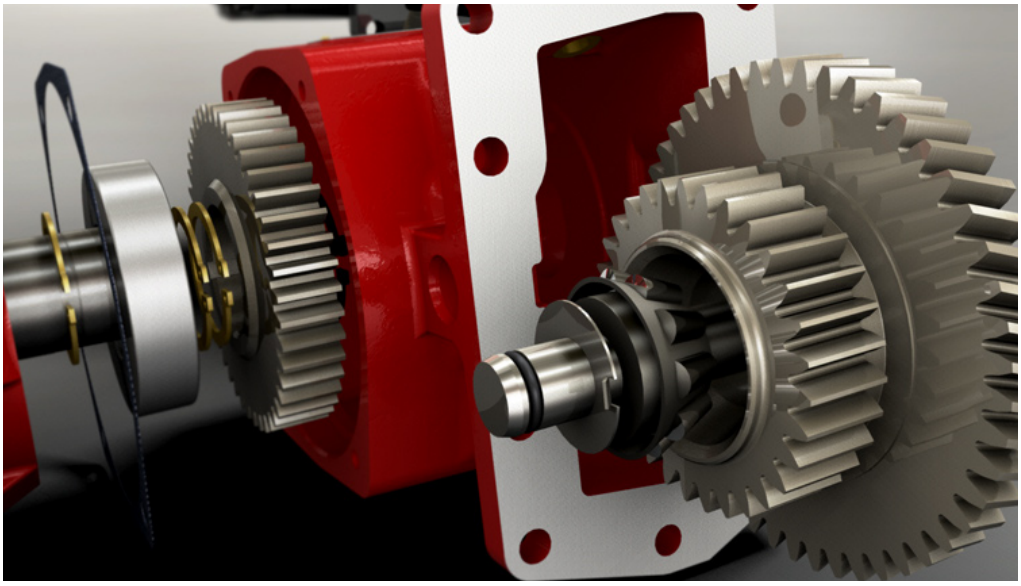


Image courtesy of Chelsea Products Division, Parker Hannifin Corp.

products—and easily integrate our designs into our digital prototypes."

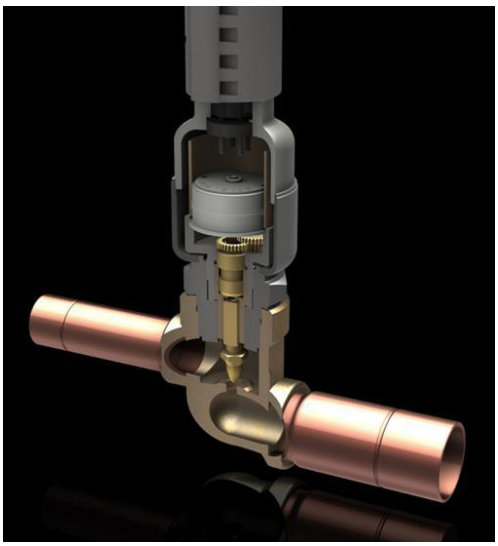
Electrical designs aren't the only data integrated into Parker's digital prototypes. In the past, the company would receive storyboards from external industrial design firms. Now, industrial designers send surface models designed in Alias software to Parker, and the company brings them directly into Inventor. "Our mechanical engineers are actually designing around these surface models," says Bosworth.

Integrating data in its all-Autodesk workflow helps Parker enhance productivity. "The data integration is seamless," continues Bosworth. "Our standardization on Autodesk lets us have a very streamlined product development process."

Faster Design Iterations

Autodesk Inventor and Digital Prototyping are also making it easier and faster for Parker to explore design iterations. Engineers can experiment with design options—and create products that are more innovative—without holding up the design process.

"Thanks to the speed and power of Inventor, we're able to do more digital prototypes and flesh out ideas very quickly," says Bosworth. "Working within our Winovation initiative, we can rapidly iterate options, and we now submit more design alternatives for review than we would have in the past. Digital Prototyping helps us find alternatives that will work better, and pushes us to be more inventive."



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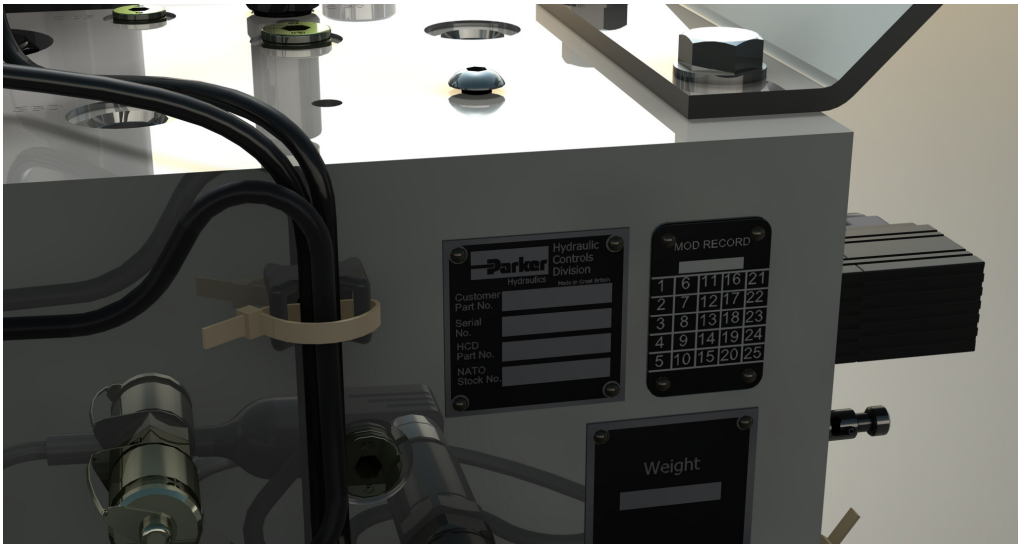


Image courtesy of Hydraulic Controls Division, Parker Hannifin Corp.

Facilitating Manufacturing and Assembly

To speed up the manufacturing and assembling process, Parker shares its digital prototypes with those partners early in the design process using Autodesk Streamline, an on-demand project management service. When changes are made to a digital prototype, Streamline notifies the partners, so that they can provide input and prepare their facilities ahead of time.

With earlier review, manufacturing partners often provide valuable feedback on designs that helps Parker keep tooling costs down and save time. Bosworth explains: "Before we incur tooling costs, manufacturers view the digital prototypes and let us know how a product can be machined. We once had a fillet around a body that was aesthetically pleasing but would be impossible to make with our existing machinery. When he looked at the digital prototype, the manufacturer told us, 'If you make this .0001" larger, we can make the part using a standard tool.' That kind of feedback makes a big impact on the manufacturability of our products."

Equally important, assembly teams view digital prototypes early enough to think about how they're going to assemble products once they're ready. "Assembly is very important to us," says Bosworth. "We need to know not only how things go together, but how we'll package them for shipping. If a sensitive piece of equipment breaks in transit, we're in trouble."

Continues Bosworth: "By getting feedback from our manufacturing and assembly teams early, we significantly compress our product development cycle."

Winning Business with Stunning Visualizations

Parker uses Autodesk Showcase visualization software to transform its digital prototypes into jaw-dropping, realistic imagery that lets customers virtually experience and explore the company's products. By highlighting its innovation and expertise so viscerally, Parker gains another competitive advantage.

"Winning new business requires that we get photorealistic images of our systems into the hands of our customers faster than the competition," says Bosworth. "And we need to create these renderings without tying up our engineers resources."

With Autodesk Showcase's advanced visualization and rendering tools, Parker can very quickly create stunning interactive and photo-realistic imagery from its Inventor data. For example, the company was able to show a Filter, Regulator, and Lubricator assembly—before the product was built. "It's very exciting that we can create our own environments that bring our products to life," says Bosworth. "Using Showcase, we can win over customers by letting them view our designs in action."

Parker is so impressed by the visualization capabilities in Showcase that it has set a goal of eliminat-

Parker saves time by getting early feedback from manufacturing and assembly teams.

ing marketing photography altogether. “To take a picture of a product, you need a physical prototype,” says Bosworth. “We don’t want to wait that long to start marketing our products. There’s also a cost to having a professional photographer. We can eliminate those cost and time constraints by rendering our products in Showcase from our digital prototypes.”

The Results

A firm believer in Digital Prototyping, Parker Hannifin knows firsthand the value of its all-Autodesk digital pipeline. Over a hundred design departments around the world are able to work within a single digital model environment—speeding design times and reducing errors. And by relying more on digital prototypes to validate designs, Parker has cut back on the expensive physical prototypes it must produce.

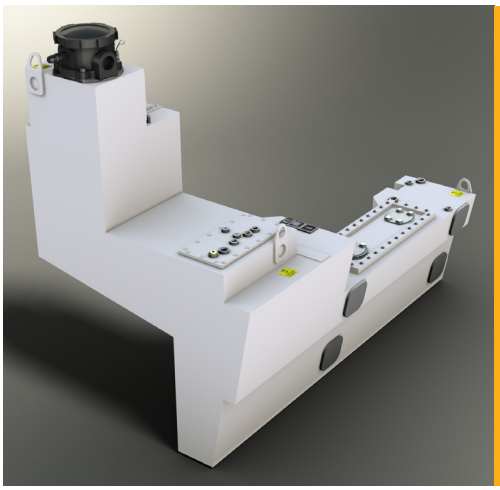
“We can’t underscore enough the value of making even one fewer physical prototype,” says Bosworth. “With Digital Prototyping, the time-to-market and cost savings are very real. That’s why we require digital prototypes for all our parts.”

Creating accurate, realistic, and compelling renderings of digital prototypes is also yielding dividends for Parker. “We’ve successfully eliminated photography in the catalogues for our instrumentation division,” says Bosworth. “And we’re doing it without tying up our precious design and engineering resources.”

Parker’s renderings are so lifelike, it has to inform customers that they are renderings and not photographs. “When we showed a rendering of a lubricator to a customer, he wanted to buy it that day,” Bosworth continues. “He was shocked to hear that we were weeks away from die casting.”

“Our partnership with Autodesk helps us stay ahead of the competition,” concludes Bosworth. “We are able to innovate faster and impress our customers even as we shift our business.”

Image courtesy of Hydraulic Controls Division, Parker Hannifin Corp.



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